

**FY 2014 Journal Publications:**

**1. Publications whose intellectual content was driven by this program**

“Ultra-Low\_Field NMR Relaxation and Diffusion Measurements Using an Optical Magnetometer”, Ganssle P.J, Shin H.D, Seltzer S.J, Bajaj V.S., Ledbetter M.P, Budker D., Knappe S., Kitching J., & [Pines A.](#), *Angewandte Chemie* vol. 53(37), p. 9766-9770, **2014**.  
Doi: 10.1002/anie.201403416.

“Optically detected cross-relaxation spectroscopy of electron spins in diamonds”, Wang H.J., Shin C.S., Seltzer S.J., Avalos C.E., [Pines A.](#), & Bajaj V.S., *Nature Communication* vol. 5, **2014**. Doi:10.1038/ncomms5135.

“Optical hyperpolarization and NMR detection of  $^{129}\text{Xe}$  on a microfluidic chip”, Jiménez-Martínez, R., Kennedy, D.J., Rosenbluh, M., Donley, E.A., Knappe, S., Seltzer, S.J., Ring, H.L., Bajaj, V.S., & Kitching, J., *Nature Communications* vol. 5:3809, **2014**.  
doi:10.1038/ncomms4908.

“Optically detected nuclear quadrupolar interaction of  $^{14}\text{N}$  in nitrogen-vacancy centers in diamond”, Shin, C.S., Butler, M.C., Wang, H.J., Avalos, C.E., Seltzer, S.J., Liu, R.B., [Pines, A.](#), & Bajaj, V.S. *Physical Review B*. vol. 89(20), p. 205202-1 - 205202-6, **2014**. Doi: 10.1103/PhysRevB.89.205202.

“Genetically encoded reporters for hyperpolarized xenon MRI”, Shapiro, M.G., Ramirez, M.R., Sperling, L.J., Sun, G., Sun, J., [Pines, A.](#), Schaffer, D.V., & Bajaj, V.S., *Nature Chemistry* vol. 6, p. 629-634, **2014**. doi:10.1038/nchem.1934.

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“Long-lived Heteronuclear Spin-Singlet States in Liquids at a Zero Magnetic Field”, Emondts, M., Ledbetter, M. P., Pustelny, S., Theis, T., Patton, B., Blanchard, J. W., Butler, M. C., Budker, D., [Pines, A.](#), *Physical Review Letters* vol.112(7), **2014**. DOI: 10.1103/PhysRevLett.112.077601.

“Molecular Sensing Using Hyperpolarized Xenon NMR Spectroscopy”, Palaniappan, K. K., Francis, M. B., [Pines, A.](#), & Wemmer, D.E., *Israel Journal of Chemistry*, vol. 54, p. 104-112, **2014**. doi: 10.1002/ijch.201300128.

**FWP Title:** Nuclear Magnetic Resonance  
**FWP Number:** KC3107  
**Lead PI:** Pines

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**BES Program Manager:** Linda Horton

"Hyperpolarized xenon-based molecular sensors for label-free detection of analytes",  
Garimella, Praveena D., Meldrum, Tyler, Witus, Leah Suzanne, Smith, Monica, Bajaj,  
Vikram Singh, Wemmer, David E., Francis, Matthew, B., & [Pines, Alexander](#), *Journal of the American Chemical Society* vol.136(1), p. 164-168, **2013**. doi: 10.1021/ja406760r.

"Suppression of electron spin decoherence of the diamond NV center by a transverse magnetic field", Shin, Chang S., Avalos, Claudia E., Butler, Mark C., Wang, Hai-Jing, Seltzer, Scott J., Liu, Ren-Bao, [Pines, Alexander](#), & Bajaj, Vikram S., *Physical Review B*, vol. 88(16), p. 161412, **2013**. DOI: 10.1103/PhysRevB.88.161412.